

No. VI.—THE LAND AND FRESHWATER MOLLUSCA OF THE
SEYCHELLES ARCHIPELAGO.

By E. R. SYKES, B.A., F.L.S.

(With 3 Text-figures.)

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In the following pages an account is given of the land and freshwater shells collected by Mr. Stanley Gardiner in the Seychelles Islands. Those from the other islands visited

Land-Shells.

| Species. | Mahé. | Praslin. | Silhouette. | Felicité. | Frigate. | I. Anonyme. |
|--|-------|----------|-------------|-----------|----------|-------------|
| * <i>Tropidophora pulchrum</i> (Gray) | × | × | × | | | |
| <i>Leptopoma seychellense</i> , Nev. | | | | | | |
| * <i>Cyathopoma blanfordi</i> , H. Ad. | × | .. | × | | | |
| * <i>Helicina theobaldiana</i> , Nev. | × | × | × | .. | .. | × |
| * <i>Ennea dussumieri</i> , Fér. | × | × | × | × | | |
| * ,, <i>moreleti</i> , H. Ad. | × | .. | × | | | |
| * ,, <i>gardineri</i> , sp. n. | × | | | | | |
| * ,, <i>thomasseti</i> , sp. n. | × | | | | | |
| ,, <i>bicolor</i> , Hutton | × | | | | | |
| * <i>Acanthennea erinaceus</i> (Martens) | × | .. | × | | | |
| * <i>Streptaxis souleyetianus</i> (Petit) | × | × | × | × | | |
| * <i>S. (Imperturbatia) constans</i> (Martens) | × | .. | × | | | |
| ,, <i>le-vieuxi</i> , Nev. | × | | | | | |
| ,, <i>violascens</i> , Martens | × | | | | | |
| * ,, <i>perelegans</i> , Martens | × | | | | | |
| * ,, <i>braueri</i> , Martens | × | | | | | |
| * <i>Priodiscus serratus</i> , H. Ad. | × | × | × | | | |
| * ,, <i>martensi</i> , sp. n. | .. | .. | × | | | |
| * <i>Streptostele nevilli</i> , H. Ad. | × | × | × | | | |
| * <i>Kabiella subturritula</i> , Nev. | × | .. | × | × | | |
| * <i>Pihula mahesiana</i> , Martens | × | .. | × | | | |
| * <i>Eulota similis</i> (Fér.) | × | × | × | | | |
| * <i>Stylodonta unidentata</i> (Chemn.) | × | × | × | | | |
| * ,, <i>studeriana</i> (Fér.) | .. | × | × | | | |
| <i>Helix aspersa</i> , Müll. | × | | | | | |
| * <i>Pachnodus ornatus</i> (Dufó) | × | × | × | | | |
| * ,, <i>velutinus</i> (Pfeiffer) | × | × | × | | | |
| ,, sp. of Nevill | .. | .. | .. | .. | × | |
| * <i>Achatina panthera</i> , Fér. | × | × | × | | | |
| * ,, <i>fulica</i> , Fér. | × | × | | | | |
| * <i>Subulina octona</i> , Brug. | × | × | × | .. | .. | × |
| * <i>Opeas javanicum</i> (Reeve) | × | × | × | × | | |
| ,, <i>mavritianum</i> , Pfr. | | | | | | |
| * ,, <i>gracile</i> (Hutton?) | .. | .. | .. | .. | .. | × |
| <i>Hapalus braueri</i> , Martens | × | | | | | |
| <i>Cæcilioides mavritianum</i> , Ad. | × | .. | × | | | |
| * <i>Pupilla microscopica</i> (Nevill) | × | × | .. | .. | × | × |
| * <i>Succinea mascarensis</i> , Nevill | × | × | × | × | | |
| 38 | 32 | 17 | 23 | 5 | 2 | 4 |

* In collection.

will form the subject of a separate paper. There is not very much novelty in the collections, as might have been expected, since careful workers have already visited the Seychelles; and an excellent account of the fauna may be found in the papers by Martens and Wiegmann*. It may be of interest to complete Martens's table of the distribution up to date, so far as it concerns the land-fauna.

Of the above-recorded forms we may note that some—*Ennea bicolor*, *Eulota similis*, *Helix aspersa*, *Subulina octona*, and the species of *Opeas*—have a wide distribution, due to man. *Leptopoma seychellense* and *Streptaxis le-vieuxi* are almost unknown; while the occurrence of *Opeas mauritianum* and *Cæcilioides mauritianum* is doubtful; the residue form the real Seychelles fauna, which is practically peculiar to the islands. Very little can be at present stated as to the origin of the fauna: *Streptaxis* shows African influence, *Stylodonta* that of Madagascar, while *Cyathopoma* is mainly Indian. The connection with any mainland must have been at a very remote period, from the well-marked forms (*Acanthennea*, *Priodiscus*, &c.) now found.

1. *Tropidophora pulchrum* (Gray).

Cyclostoma pulchrum, Gray; Griffith's Animal Kingd., Moll. 1834, pl. 28. fig. 3; Martens, Mt. Zool. Mus. Berlin, i. (1898) p. 4.

Mahé: Château Margot, 1600 feet; Morne Seychellois, 2000 feet; summit of Mt. Sebert, 1800 feet; Mt. Alphonse, Cascade, 1000–1800 feet; Mountain Forest, Cascade; N. of Victorine.

Praslin: Valley of Coco de Mer.

Silhouette.

Martens considered Pfeiffer's *Leptopoma seychellarum* to be the possible young of this species. If the British Museum specimens are to be relied on they belong to a distinct form, and I doubt if Pfeiffer's locality was quite accurate. *Leptopoma seychellense*, Nevill, is unknown to me.

2. *Cyathopoma blanfordi*, H. Adams.

Cyathopoma blanfordi, Adams, Proc. Zool. Soc. 1868, p. 291; Martens, *l. c.* p. 5.

Mahé: summit of Mt. Sebert, 1800 feet; Cascade Forest; Morne, 2500 feet.

Silhouette.

From the last locality the specimens are large.

3. *Helicina theobaldiana*, Nevill.

Helicina theobaldiana, Nevill, J. As. Soc. Bengal, xxxix. p. 8 (1871); Martens, *l. c.* p. 6.

Mahé: summit of Mt. Sebert, 1800 feet; Mountain Forest, Cascade, 2000 feet; Mt. Alphonse, Cascade, 1000–1800 feet; N. of Victorine; Morne Seychellois, 2500 feet; Bel Ombre; Château Margot, 1600 feet.

Silhouette.

Praslin: Valley of Coco de Mer.

Anonyme I.

* Mt. Zool. Mus. Berlin, i. (1898) pp. 1–94, pls. 1–4.

4. *Ennea dussumieri*, Férussac.

Ennea (Edentulina) dussumieri, Fér. ; Martens, Mt. Zool. Mus. Berlin, i. (1898) p. 7.

Mahé: Trois Frères, 1500 feet; Mountain Forest, Cascade; Mt. Alphonse, Cascade, 1800 feet; summit of Mt. Sebert; Morne Seychellois, 2500 feet; Château Margot, 1600 feet.

Silhouette.

Praslin: Valley of Coco de Mer.

5. *Ennea moreleti*, H. Adams.

Gibbus moreleti, H. Adams, Proc. Zool. Soc. 1868, p. 291.

Ennea (Edentulina) moreleti, H. Ad.; Martens, *l. c.* p. 8.

Mahé: Cascade Forest.

Silhouette.

6. *Ennea gardineri*, sp. n. (See fig. 1.)

Shell cylindrical, smooth, shining, with the apex rounded, opaque, very pale horn-colour; whorls $8\frac{1}{2}$, flattened, with well-marked suture, the last whorl ascending where the outer lip joins the body-whorl; mouth subquadrate, edentulous, outer lip thickened and the columellar margin twisted.

Alt. 6; diam. max. 2.6 millim.

Hab. Mahé: Mt. Alphonse, Cascade, 1800 feet (type); Mountain Forest, Cascade, 2000 feet; summit of Mt. Sebert, 1800 feet.

Var. *a.* Smaller and narrower in proportion.

Hab. Mahé: Cascade Forest.

Fig. 1.



Ennea gardineri, $\times 5$.

I think these two forms are only races of one species, which may be distinguished from the others described from the Seychelles by its small size and polished smooth surface. I have much pleasure in giving it the present name.

7. *Ennea thomasseti*, sp. n. (See fig. 2.)

Shell elongate-cylindrical, smooth, shining, almost transparent, very pale horn-colour;

whorls 8, the last measuring about $\frac{1}{3}$ of the entire shell, flattened, suture well marked; mouth lunate, edentulous, the lip thickened and receding at the base, the columellar margin slanting and a trifle twisted.

Alt. 4.5; diam. max. 1.3 millim.

Hab. Mahé: Mountain Forest, Cascade.

A single specimen, far smaller than any other Seychelles form.

Fig. 2.



Ennea thomasseti, $\times 6$.

8. *Acanthennea erinaceus* (Martens).

Ennea (Acanthennea) erinaceus, Martens, Mt. Zool. Mus. Berlin, i. (1898) p. 8; Wiegmann, *t. c.* p. 45.

Mahé: Cascade Forest. 2000 feet; Mt. Alphonse, Cascade, 1800 feet.

A nice series of this interesting form.

9. *Streptaxis souleyetianus* (Petit).

Helix souleyetiana, Petit, Rev. Zool. 1841, p. 99.

Streptaxis souleyetianus, Petit; Martens, *l. c.* p. 10.

Mahé: Mt. Alphonse, Cascade, 1800 feet; Mountain Forest, Cascade, 2000 feet; Château Margot, 1600 feet; Trois Frères, 2000 feet; Bel Ombre.

Praslin: Valley of Coco de Mer.

Silhouette.

10. *Streptaxis (Imperturbatia) constans* (Martens).

Streptaxis (Imperturbatia) constans, Martens, *l. c.* p. 11.

Mahé: Cascade Forest, 2000 feet; Mt. Alphonse, Cascade, 1800 feet.

Silhouette.

From the latter locality a large form with the sculpture not so marked, especially below, but I think it is only a local race.

11. *Streptaxis (Imperturbatia) perelegans*, Martens.

Streptaxis (Imperturbatia) perelegans, Martens, *l. c.* p. 12.

Mahé: Cascade Forest; Mt. Sebert, 1800 feet.

12. *Streptaxis (Imperturbatia) braueri*, Martens.

Streptaxis (Imperturbatia) braueri, Martens, Mt. Zool. Mus. Berl. i. (1898) p. 13.

Mahé: Trois Frères, 1500 feet; Mountain Forest, Cascade, 2000 feet; Mt. Alphonse, Cascade, 1800 feet; Morne, 2500 feet.

13. *Priodiscus serratus*, H. Adams.

Discus serratus, H. Adams, Proc. Zool. Soc. 1868, p. 290.

Priodiscus serratus, H. Ad.; Martens, *l. c.* p. 14.

Mahé: Cascade Forest, 1000 and 2000 feet; Mt. Alphonse, Cascade, 1800 feet; Mt. Sebert, 1800 feet.

Praslin: Valley of Coco de Mer.

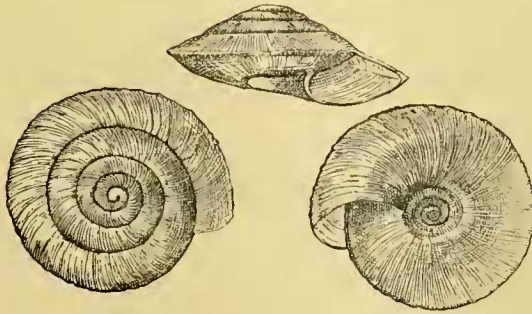
14. *Priodiscus (?) martensi*, sp. n. (See fig. 3.)

Shell depressed, trochiform, the outline being rather concave than convex, brownish corneous, deeply, somewhat openly, umbilicated, the umbilicus being pervious to the apex; protoconch smooth, the next whorl is marked by coarse radiating riblets, which then cease and the residue of the shell bears only well-marked lines of growth; periostracum olivaceous, thicker at the sutures, where traces of prolongations may be seen, periphery keeled and rugose; whorls 5, regularly increasing, plano-convex, with fairly deep sutures; base flattened and angulated round the umbilical area; mouth subquadrate.

Alt. 2.75; diam. max. 6 millim.

Silhouette.

Fig. 3.



Priodiscus (?) martensi, × 3.

Two specimens only of a difficult form. At first sight the shell recalls the genus *Thysanota*, but I have seen no species of that group with a similar sculpture on the early whorls. From an examination of this sculpture compared with that of *Priodiscus serratus*, Adams, combined with the fact that two young shells fell out of the mouth of the type, I am led to place it here. *P. serratus* may be readily separated by its well-marked sculpture over the whole of the shell.

15. *Streptostele nevilli*, H. Ad.

Ennea (Elma) nevilli, H. Adams, Proc. Zool. Soc. 1868, p. 291.

Streptostele (Elma) nevilli, H. Ad.; Martens, Mt. Zool. Mus. Berl. i. (1898) p. 14.

Mahé: Château Margot, 1800 feet; Mountain Forest, Cascade, 1000–1500 feet; summit of Mt. Sebert, 1800 feet; Mt. Alphonse, Cascade, 1000–1800 feet.

Silhouette.

Praslin: Valley of Coco de Mer.

16. *Kaliella subturritula*, Nevill.

Helix (Conulus) subturritula, Nevill, J. As. Soc. Bengal, xxxix. (1871) p. 7.

Kaliella subturritula, Nevill; Martens, *l. c.* p. 16.

Mahé: Mt. Alphonse, Cascade, 1800 feet; Mountain Forest, Cascade, 2000 feet; Château Margot, 1600 feet.

There may be more than one form here, but I am not well enough acquainted with the genus to discriminate them.

17. *Pilula mahesiana*, Martens.

Helix pratumida, Morel., var. *mahesiana*, Martens; Martens, *l. c.* p. 16.

Mahé.

A study of authentic specimens of Morelet's *Helix pratumida*, kindly lent by Mr. Ponsonby, leads me to regard Martens's variety as being a distinct species from the Réunion shell. It is smaller, not so swollen or elevated, and I am unable to trace, in Morelet's species, the well-marked spirals so characteristic of *Pilula mahesiana*.

18. *Eulota similaris* (Férussac).

Helix (Eulotella) similaris, Férussac; Martens, *l. c.* p. 17.

Mahé: N. of Victorine; Cascade Forest; Bel Ombre; Château Margot, 1600 feet.

Silhouette.

Praslin.

Widely distributed over the world, especially where coffee is grown.

19. *Stylodonta unidentata* (Chemnitz).

Helix unidentata, Chemnitz; Martens, *l. c.* p. 18; Pilsbry, Man. Conch. vi. p. 86.

Mahé: Mountain Forest, Cascade; Cascade, 1000 feet; Trois Frères.

Silhouette.

Praslin.

20. *Stylodonta studeriana* (Férussac).

Helix studeriana, Férussac; Martens, *l. c.* p. 18; Pilsbry, Man. Conch. vi. p. 87.

Praslin.

21. *Pachnodus ornatus* (Dufo).

Bulimus ornatus, Dufo, Ann. Sci. Nat. (sér. 2) xiv. (1840) p. 197; Martens, Mt. Zool. Mus. Berl. i. (1898) p. 20.

Mahé: Morne, 2500 feet; summit of Mt. Sebert; Château Margot, 1600 feet; Mt. Alphonse, Cascade, 1800 feet.

Praslin: Valley of Coco de Mer.

Silhouette.

22. *Pachnodus velutinus* (Pfeiffer).

Bulimus velutinus, Pfeiffer, Symb. i. p. 42; Martens, *l. c.* p. 22.

Mahé: Trois Frères, 1500 feet; Morne, 2500 feet; Cascade, 1000 feet; summit of Mt. Sebert; Château Margot, 1600 feet; Mt. Alphonse, Cascade, 1800 feet; &c.

A long series of this interesting form.

23. *Achatina panthera*, Férussac.

Achatina panthera, Férussac; Martens, *l. c.* p. 22; Pilsbry, Man. Conch. xvii. p. 41.

Mahé: Trois Frères, 1500 feet; Château Margot.

Silhouette.

Praslin.

In addition to its East African distribution, this species has been recorded from Madagascar, Mauritius, and Réunion.

24. *Achatina fulica*, Férussac.

Achatina fulica, Férussac; Martens, *l. c.* p. 22; Pilsbry, Man. Conch. xvii. p. 57.

Praslin.

Reported from Madagascar, Mauritius, &c.

25. *Subulina octona*, Bruguière.

Helix octona, Bruguière, Encycl. Méth. i. p. 325.

Subulina octona, Brug.; Martens, *l. c.* p. 23; Pilsbry, Man. Conch. xviii. pp. 71, 222.

Mahé: Château Margot, 1600 feet; Trois Frères, 1500 feet; Morne, 2000 feet; N. of Victorine; Bel Ombre.

Praslin.

Silhouette.

Anonyme I.

Genus *OPEAS*.

The species of this genus are very puzzling. I have endeavoured, with the assistance of Mr. Pilsbry's excellent work, correctly to identify them. The form recorded by Martens as *O. clavulinum* may belong really to *O. javanicum*. His *Hapalus braueri* must, I think, belong to the *Opeas* group, but I have been unable to identify it in the specimens before me.

26. *Opeas javanicum* (Reeve).

Achatina javanica, Reeve, Conch. Ieon. pl. 17. fig. 79.

Opeas javanicum, Reeve ; Pilsbry, Man. Conch. xviii. p. 138.

Mahé: Cascade, 1000–1500 feet.

27. *Opeas gracile* (Hutton?).

Bulinus gracilis, Hutton, J. As. Soc. Bengal, iii. p. 93.

Opeas gracile, Hutton ; Pilsbry, Man. Conch. xviii. p. 125.

Anonyme I.

I am not quite sure of the identification.

28. *Pupilla microscopica* (Nevill).

Pupa microscopica, Nevill, Handl. Moll. Ind. Mus. i. p. 196 ; Martens, Mt. Zool. Mus. Berl. i. (1898) p. 25.

Mahé: Baie Lazare.

Anonyme I.

29. *Succinea mascarensis*, Nevill.

Succinea mascarensis, Nevill, J. As. Soc. Bengal, xxxix. p. 414.

Succinea mascarena, Nev. ; Martens, *l. c.* p. 25.

Mahé.

Praslin.

30. *Paludomus baccula*, Reeve.

Paludomus baccula, Reeve, Proc. Zool. Soc. 1852, p. 128.

Silhouette: stream north of Grand Barbe.

I am able, from an examination of Morelet's and Reeve's types, to confirm Brot's decision as to the identity of Morelet's *Cleopatra ajanensis*; no doubt Reeve's Indian habitat was an error.

31. *Melania tuberculata*, Müller.

Melania tuberculata, Müller ; Brot, Conch.-Cab., *Melania*, p. 247.

Mahé: Bel Ombre.

Praslin.

Silhouette: La Passe River.

32. *Neritina bruguieri*, Récluz.

Neritina bruguieri, Récluz, Rev. Zool. 1841, p. 274 ; Martens, *l. c.* p. 26.

Praslin